

IN THE CLAIMS:

Please amend claims 1, 8 and 15, and cancel claim 2 as follows. This listing of claims will replace all prior versions and listings of claims in the application:

Claim 1. (currently amended): A cell sorter comprising:

a [stepping] pulsed-mode precision microdisplacement pump coupled to a fluid inlet port, said pump causing fluid containing desired cells to enter said inlet port and stopping fluid flow when a particular cell is at a predetermined position;

a cell detection system fluidly coupled to said inlet port, said cell detection system determining whether a particular cell stopped at said predetermined position is a desired cell;

a sorting gate including a magnetostrictive actuator rod, said sorting gate having [with] at least two states fluidly coupled to said cell detection system, said sorting gate allowing said desired cell to exit a cell collection port and allowing waste to exit a waste port in accordance with the determination of said cell detection system;

a control unit connected to said pump, said cell detection system and said sorting gate for synchronizing discrete fluid microdisplacements by said pump with said cell detection system and magnetostrictive actuator of said sorting gate, said control unit processing information from said cell detection system and causing said pump to stop cells in said fluid at said predetermined position, [and]

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causing said sorting gate to select said cell collection port when a cell is a desired cell [is in a proper position], and then starting said pump to cause said desired cell to exit said cell collection port.

Claim 2.(Canceled).

Claim 3.(original): The cell sorter of claim 1 wherein said cell detection system is optical.

Claim 4.(original): The cell sorter of claim 3 wherein said cell detection system uses fluorescence.

Claim 5.(original): The cell sorter of claim 3 wherein said cell detection system uses scattered light.

Claim 6.(original): The cell sorter of claim 3 wherein said cell detection system uses both fluorescence and scattered light.

Claim 7.(original): The cell sorter of claim 6 wherein a fluorescence and scattered light determination is made simultaneously.

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Claim 8. (currently amended): A cell sorter system for sorting desired cells from undesired matter comprising:

a [stepping] pulsed-mode precision microdisplacement pump coupled to a capillary for causing fluid containing cells to enter said capillary;

an optical detection system in proximity to [said] a predetermined position in said capillary; and

a magnetostrictive gate switching between a cell exit port and a waste port in said capillary;

said pulsed-mode pump pumping cell-containing fluid into the capillary and controlling positions of cells in said capillary by stopping flow when said optical detection system determines that a [a desired] cell is [in a] at said predetermined position in said capillary;

said optical detection system determining whether said individual cell is a desired cell while stopped at said predetermined position;

said magnetostrictive gate switching flow from said waste port to said cell exit port when said pump stops allowing the desired cell to pass through said cell exit port by pulsing the pump to move said cell through said cell exit port.

Claim 9.(previously presented): The cell sorter system of claim 8 further comprising a means for

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applying a magnetic field to said magnetostrictive gate, whereby said magnetostrictive gate switches from said waste port to said cell exit port.

Claim 10.(previously presented): The cell sorter system of claim 8 wherein said optical detection system uses fluorescence.

Claim 11.(previously presented): The cell sorter of claim 8 wherein said optical detection system uses scattered light.

Claim 12.( previously presented): The cell sorter system of claim 8 wherein said optical detection system uses both fluorescence and scattered light simultaneously.

Claim 13.( previously presented): The cell sorter system of claim 8 wherein said optical detection system includes a photomultiplier.

Claim 14.( previously presented): The cell sorter system of claim 8 wherein said optical system includes a diode array.

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Claim 15.( currently amended): A method for sorting cells comprising:

causing fluid containing cells to enter an inlet port of a capillary by pulsing a precision microdisplacement pump, thereby incrementally pumping said fluid [with a stepping precision pump];

causing said fluid to pass through an optical detection region where said fluid is exposed to light of at least one predetermined wavelength, wherein scattered light or fluorescence from said cells is used to choose a particular desired cell;

stopping said stepping precision pump when said particular desired cell is in a predetermined position in proximity to a cell exit port;

applying a magnetic field to a magnetostrictive gate causing said magnetostrictive gate to open said cell exit port;

pulsing said stepping precision pump to cause said particular desired cell to pass through said cell exit port;

removing said magnetic field from said magnetostrictive gate causing said magnetostrictive gate to close said cell exit port;

drawing said particular desired cell from said exit port.

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Claim 16. (canceled).

Claim 17.(original): The method of claim 15 wherein said magnetostrictive gate contains a magnetostrictive rod.

Claim 18.(original): The method of claim 17 wherein said magnetostrictive rod changes length in an applied magnetic field.

Claim 19. (previously presented): The method of claim 15 wherein said light is directed into said optical detection region by fiber optics.

Claim 20. (cancelled).

Claim 21.( previously presented): The cell sorter of claim 1 further comprising said control unit pulsing said pump to pump an amount of fluid sufficient to move said desired cell into said cell collection port after said sorting gate has selected said cell collection port.

Claim 22.( previously presented) The method of claim 15 wherein the step of drawing said particular desired cell from said exit port is performed using a vacuum.